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A SCIENTOMETRIC STUDY ON THE JOURNAL RUBBER CHEMISTRY AND TECHNOLOGY: 2005 -2014

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ABSTRACT

Scientometric analysis of 436 articles, published in "Rubber Chemistry and Technology" has carried out. Ten volumes of the journal, containing 45 issues from 2005-2014, has been taken into consideration in the present study. The number of contributions, authorship pattern & author productivity, average length of article keywords and collaborative papers, has been analyzed. Out of 436 contribution 65, are single authored and the rest is, by multi authored with degree of collaboration 0.85 patterns of Co-Authorship revealed that, the improving trend of co-authored papers.

KEYWORDS: Scientometric, Rubber Chemistry and Technology, Author Productivity

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Original Article

INTRODUCTION

Scientometric can be defined as the "Quantitative study of science, communication in science, and science policy" (Hess, 1997, 75). Scientometric is the study of measuring and analyzing, science & technology and innovation. In practice, Scientometric is often done, using bibliometrics, which is a measurement of the impact of (scientific) publications. Modern scientometrics is mostly based on the work of Derek J.de solla price and Eugene Garfield. The latter founded the institute for scientific information, which is ardently used in scientometric analysis methods of research includes qualitative, quantitative and computational approaches. One significant finding in the field is a principle of cost escalation, to the effect that, achieving further findings at a given level of importance grow exponentially more costly in the expenditure of effort and resources.

Importance of Scientometric Studies

- To determine the size of the scholarly enterprise.
- The productivity of scholarly authors.
- Geographical origin.
- Form of transmission.
- To know the medium of communication.
- The amount of information conveyed.
- Pertinence and relevance of information to society.

SOURCE JOURNAL

Rubber chemistry and technology was selected, as the source journal for the present research. The journal was established in 1928, with "Carroll C. Davis", as its first editor-in-chief. It is published by the American chemical society Rubber Division. RCT is a quarterly peer-reviewed scientific journal covering research, technical developments, and chemical engineering, relating to Rubber and its allied substances. The journal currently publishes four issues per year. One issue is dedicated to reviews of topics in rubber science, including a review by the most recent Good year medalist. The remaining issues contain original research contribution.

OBJECTIVES OF THE STUDY

- To study year wise growth.
- To study the authorship pattern.
- To study the period and volume wise authorship pattern.
- To study authors productivity.
- To examine the single and multi authored papers of the journal and,
- Degree of collaboration.

SCOPE AND METHODOLOGY

The present study aims to find out, the authorship and collaboration pattern, average length of articles and average keywords, in the source journal. Ten volumes (Vol.No.78 to 87) of journal of Rubber chemistry and technology, published between 2005-2014, containing 45 issues have been taken into consideration, in the present study. The details regarding number of papers, nature of author, keywords and length of papers are collected, to fulfill the objectives of the present study. The collected data were analyzed, with the following bibliometrics indicators.

- Extent of authorship pattern (Single vs multiple)
- Degree of collaboration.

Table 1: Year Wise Distribution of Articles

Year	Vol. No	No. of. Issues	Total No. of. Articles	% of Articles
2005	78	5	58	12.94%
2006	79	5	51	11.38%
2007	80	5	53	11.83%
2008	81	5	45	10.04%
2009	82	5	33	7.36%
2010	83	4	28	6.25%
2011	84	4	37	8.25%
2012	85	4	41	9.15%
2013	86	4	43	9.59%
2014	87	4	47	10.77%
Total		**45**	**436**	**100%**

Table: 1, shows the distribution of articles published in the journal of Rubber Chemistry and Technology, during 2005-2014. Out of 436 articles, the highest numbers of articles were published, in the year 2005, with 58 articles (12.94%), followed 28 articles are the lowest numbers of articles were published in the year 2010 (6.25%)

Table 2: Authorship Pattern

Authors	No. of. Papers	%
Single	65	14.90%
Two	88	20.18%
Three	109	25.00%
Four	87	19.95%
>Four	86	19.72%
Total	**436**	**100**

It is observed from the **Table 2,** about 80% of papers was contributed by multiple authors. Out of 436 papers, the highest number of papers was published by three authors and it accounts for 109 with 25.00%, followed by a double authored articles account, for 88 with 20.18%, 19.95% & 19.72% of articles were published, by four and more than four authors. 14.90% of articles were published by single authors. (But the trend of the author pattern in the journal shows that the team size was two to four)

Table 3: Authorship Pattern Year Wise

Year	Authors				
	1	**2**	**3**	**4**	**>4**
2005	7	10	16	15	10
2006	8	19	12	9	3
2007	10	9	20	8	6
2008	6	10	8	11	10
2009	6	8	10	1	8
2010	7	7	7	3	5
2011	5	10	11	6	5
2012	8	6	7	12	8
2013	6	6	4	14	12
2014	2	3	14	9	19
Total	**65**	**88**	**109**	**88**	**86**

Table: No: 3, Regarding single authored contributions, the year 2007 have the highest contribution with 10 articles and the lowest in 2011, with 5 articles. Regarding double authored contributions, 2006 has the highest contribution with 19 articles. The Year 2007 & 2005 has the highest contribution, with 20&15 articles, regarding three and four authors. The year 2014, has the highest contributions of multi authored (More than five authors), with 19 articles.

Table 4: Author Productivity

Year	Total. No. of. Papers	Total No. of Authors	AAPP	Productivity per Author
2005	58	185	3.18	0.31
2006	51	133	2.60	0.38
2007	53	150	2.83	0.35
2008	45	144	3.2	0.31
2009	33	96	2.90	0.34
2010	28	79	2.82	0.35
2011	37	107	2.89	0.34
2012	41	129	3.14	0.31
2013	43	146	3.39	0.29
2014	47	207	4.40	0.22
Total	**436**	**1376**	**3.15**	**0.31**

Table No.4 shows that, the total average number of authors per paper is 3.15, for the 436 articles. The average

productivity per author is 0.31, during the year 2005 – 2014. Productivity has been calculated with the following formula.

Average Authors per paper = No. of Author / No. of papers

Productivity per Author = No. of papers / No. of Authors

Table 5: Degree of Collaboration

Year	Single	Multiple	DC
2005	7	51	0.87
2006	8	43	0.84
2007	10	43	0.81
2008	6	39	0.86
2009	6	27	0.81
2010	7	22	0.75
2011	5	32	0.86
2012	8	33	0.80
2013	6	36	0.85
2014	2	45	0.95
Total	**65**	**371**	**0.85**

To determine the Degree of collaboration (DC), the following formula suggested by K. Subramanyam (1983) is employed here:

Dc = (Nm / Nm) +Ns

Where,

Dc = Degree of Collaboration

Nm = Number of Multiple Authored papers

Ns = Number of single Authored papers

The Degree of a collaboration of authors, by year wise, is presented in table 5. The degrees of collaboration rank from 0.75 to 0.87. The average degree of collaboration is 0.85, during the period 2005-2014, and it brings out clearly that, there exists a higher level of collaboration with the journal.

Table 6: Distribution of Pages

Year	No. of. Article	Total Pages	Average Pages per Articles
2005	58	909	15.67
2006	51	891	17.47
2007	53	906	17.09
2008	45	880	19.55
2009	33	540	16.36
2010	28	426	15.21
2011	37	593	16.02
2012	41	670	14.25
2013	43	678	15.76
2014	47	679	14.44
Total	**436**	**7172**	**16.44**

Table 6, reveals that, 436 papers published with a total page 7172 (average 16.44 pages per article), during the year 2005 – 2014. It is observed that, the average length of the article varied from a minimum of 14.25 pages, to a maximum of 19.55 pages.

FINDINGS AND CONCLUSIONS

The analysis reveals the following conclusions.

- The maximum number of papers published in 2005 and minimum in 2010.
- The highest number of articles contributed by multiple authors during the study period.
- The degree of collaboration was 0.85.
- The author productivity is 0.31 and the average number of authors per paper is 3.15.
- The average pages per paper are 16.44 .
- The year – wise distribution has been shown in this study.

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